



# State of Utah

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December 19, 1989

U. S. Department of Energy  
Attn: Dee Williamson, Manager  
Grand Junction Project Office  
P.O. Box 2567  
Grand Junction, Colorado 81503

Dear Mr. Williamson:

We have completed our review of the proposed plan and feasibility study for the subject project. Our comments cover three general areas; site selection, ground water, and cell design. Our comments follow:

## I. Siting

The Bureau recommends that the entire south area, comprised of the near south site and far south site be identified as the repository area. This will allow flexibility in the design process to site the repository in an ideal position based on any further data which may be collected. There exist concerns with the site based on data which is presently available. These concerns are listed as follows:

- A. As stated previously, the Bureau feels that the most acceptable site for the repository is the far south site. There have been questions raised during the review process which have led to negative discussions regarding the near site. The near site poses a number of critical engineering problems if the cell were to be constructed in accordance with UMTRA standards. The near site also poses a number of problems with regards to physically being able to perform remedial action through construction. The technical issues regarding siting the repository on the near south site are as follows:
1. The near south site does not provide adequate space and flexibility to stabilize the tailings and still have room for overruns which may occur.
  2. If the near south site were to be used, a staging area would be required at the far south site as well during construction. Therefore, the far south site is going to be impacted regardless of whether we use the near site or the far site.

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3. There have been questions and some discussion regarding benching and placing the tailings on the side slope of the Montezuma Creek channel. There are some critical problems with this proposal. If the project were to proceed as proposed and be benched on the channel side slope, the effective benching area would be reduced by half because of the presence of the Manchos shale halfway up the slope. The Manchos formation is extremely hard and blasting would have to occur in order to use that area. Accepted UMTRA construction procedures do not allow for planned blasting operations because it tends to have a deleterious effect on subsurface formations. Disturbance of the attenuating characteristics of the subsurface materials could result. If we are relegated to using the top of the side slope, the embankment would then be placed in alluvial deposits on top of the Manchos formation. If benching were to occur in these alluvial deposits, there would be an increased risk to back-cutting from erosion. The Bureau cannot see any justification or accepted construction which would protect the side slopes for a one-thousand year design life.

It is also evident from a cursory site review that ground water has run to daylight along the bench area. If this is the case, placing tailings past the formations which cause the ground water to daylight on the side slope would expose the tailings to the ground water with the potential for contaminated water daylighting into the channel.

4. There is evidence that back-cutting has occurred in the area witnessed by the number of small drainage channels which are cut back from the tailings area into the side slopes of the channel.
5. The efficiencies which are associated with construction of the repository are greatly reduced if the near south site is used because construction activity would be so confined that inefficient double-handling procedures would be required.
6. The near south site is also in an area where it can be seen from the town of Monticello and from the highway. The far south site is less intrusive and is a much larger area allowing for a smaller profile.
7. The far south site is further in distance from the tailings pile; however, it is at near the same elevation as the near south site. Therefore, haulage to either site would require approximately the same distance due to the grades required to access either site. The far south site provides additional protection at completion because of the distance to the channel. This will allow extra protection for back-cutting into the pile.
8. The far south site also adds much flexibility in construction. It is located in an open area where an efficient cut and fill operation can occur and a comfortable barrier can be established around the perimeter of the final embankment.

- B. It is the Bureau's position that the entire area is adequate for siting of the repository. If it is determined that this area is on-site, the Bureau recommends that reporting requirements and criteria be established so that the DOE and its contractors are not only complying with all permits issued for the construction process but also issue reports generated for self-monitoring.

## II. Ground Water Restoration

The Bureau of Radiation Control concurs with the Bureau of Solid & Hazardous Waste comments on the proper approach to restoring the ground water. It has been our experience that remedial action construction activities serve to drastically alter the condition of the contamination of the aquifer. A decision as to what to do with the contaminated aquifer should be deferred until remedial action is complete.

However, the Bureau has one recommendation. During the planning and design period, a contract should be written by the DOE to install an inexpensive liner or pipe in any water course above and through the tailings to prevent further contamination of the ground water. The tailings would not be recharged, reducing leachate generation into the aquifer. Lining or blocking and diverting the water course will be a key item during remedial action, and should be accomplished as early as possible.

## III. Cell Design

The Bureau does not agree with the proposed cell design as shown in the feasibility study. The Bureau also disagrees with the comment that this is a study process and that the final details to cap design and cell design will be made during remedial design phase. A somewhat detailed effort must be expended during the study phase in order to decide where the tailings can be placed. A determination as to whether acceptable rock is available needs to be made. Also, an investigation into the availability of adequate radon barrier materials, together with constructability reviews need to be considered during this phase of the process. It is also required that the cell cap design reflect the latest design approach from UMTRA process.

Currently, a Claymax vegetative top is approved by DOE; however, on five-to-one slopes, Claymax cannot be used. It is the Bureau's position that Claymax not be used at all where possible and that the slopes either be all five-to-one slopes or that current acceptable developments such as bentonite amended sands or gravels be used for the radon barrier. Where bentonite is added to sands or gravels it adds to the strength of the barrier. The barrier can then be placed on a five-to-one slope, and it can be thicker and more constructable. Vegetation and the Claymax barrier can then be eliminated.

The problems with using Claymax are twofold: 1. The Claymax barrier must be protected and the sections shown in the feasibility study cannot be constructed using conventional construction methods. Secondly, Claymax is a patented product and therefore it would require sole-source procurement which should be avoided if possible.

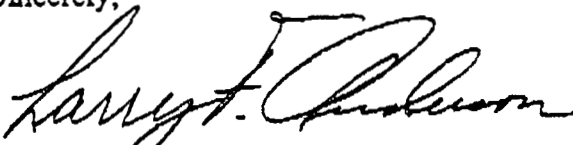
The Bureau's recommendation for a cell design includes a bottom buffer cushion to be placed underneath the tailings. Then the tailings would be placed at extremely dry conditions and at 100% compaction. The radon barrier can thus be placed on top of the tailings at two to three feet of thickness with sand or gravel added for strength. On top of the radon barrier we recommend a six inch to one foot layer of bedding material, preferably angular rock, with a two foot layer of rock rip rap on top. The toe design should be performed so as to prevent back-cutting into the embankment. This design will allow the cell to act as a unit in protecting the ground water beneath.

IV. Health and Safety Plan

The Health and Safety Plan provided covers most of the concerns we have. However, no sample of the training assessment examination is shown. We would like to see one included. Also, the plan needs to be written as a site-specific document.

This completes our comments on the feasibility study and proposed plans for the Monticello Project. If you have any questions or concerns, please call Mark S. Day at (801) 538-6734.

Sincerely,

A handwritten signature in cursive script, appearing to read "Larry F. Anderson".

Larry F. Anderson, Director  
Bureau of Radiation Control